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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHAKRABARTI, ARUN K

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 09/17/2002

13

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/870,986

Applicant(s)

SARAF ET AL.

Examiner

Arun Chakrabarti

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 24-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 12.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: *Detailed Action*.

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## DETAILED ACTION

### *Continued Examination Under 37 CAR 1.114*

1. A request for continued examination under 37 CAR 1.114, including the fee set forth in 37 CAR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CAR 1.114, and the fee set forth in 37 CAR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CAR 1.114. Applicant's submission filed on July 17, 2002 has been entered.

### *Specification*

2. Claims 1, and 20 have been amended.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

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4. Claims 1, 2, 4-7, 13-17, 19, and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Caldwell et al. (U.S. Patent 6,284,503 B1) (September 4, 2001).

Caldwell et al teach a tagging-free method to detect the binding of an untagged single stranded nucleic acid sequence to an untagged material of interest (Column 17, lines 55-67), comprising the steps of:

a) providing a sensor comprised of a first layer and a second layer wherein the first layer comprises an untagged single stranded nucleic acid sequence and wherein the second layer comprises a photoluminescent material, and wherein the first layer and the second layer are separate layers (Column 17, lines 55-67);

b) exposing the sensor to a biological sample for sufficient time for the untagged single stranded nucleic acid sequence to bind an untagged material of interest in the biological sample;

c) applying light to the sensor (Column 17, lines 65-67); and

d) measuring photoluminescence from the sensor, wherein photoluminescence measured in the step of exposing is indicative of binding the untagged single stranded nucleic acid sequence to the untagged material of interest (Column 17, lines 55-67).

Caldwell et al inherently teach a method, wherein the single stranded nucleic acid is different DNA molecules having 5-200 base pairs (primers directed at conserved regions of an HIV gene as specified in Column 17, lines 53-55).

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Caldwell et al teach a tagging free method, wherein the second layer comprises a matrix material, with the photoluminescent material associated with the matrix material (Column 17, lines 60-64).

Caldwell et al. teach a tagging free method, wherein the second layer comprises polystyrene (Column 6, lines 28-41).

Caldwell et al. teach a tagging free method, wherein the second layer comprises photoluminescent particles in a polymer matrix (Column 17, lines 60-64).

Caldwell et al. teach a tagging free method, wherein the first layer comprises an ssDNA monolayer (Column 17, lines 55-57).

Caldwell et al. teach a tagging free method, wherein the second layer comprises a thin film or support (Column 6, lines 28-59).

Caldwell et al. teach a tagging free method, wherein the second layer comprises a polymer (Column 6, line 28 to Column 7, line 60).

Caldwell et al. teach a tagging free method, wherein the sensor comprises ssDNA as the first layer grafted onto the second layer (Column 17, lines 60-64).

Caldwell et al. teach a tagging free method, wherein the first layer comprises a plurality of sections each of which comprises a different nucleic acid sequence (Column 17, lines 60-67).

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***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CAR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 3, 8-12, 18, and 21-23 are rejected over Caldwell et al. (U.S. Patent 6,284,503 B1) (September 4, 2001) in view of Bhargava et al. (U.S. Patent 6,241,819 B1) (June 5, 2001).

Caldwell et al teach a method of claims 1, 2, 4-7, 13-17, 19, and 20 as described above.

Caldwell et al do not teach doped or undoped zinc sulfide in a nanocomposite.

Bhargava et al teach doped or undoped zinc sulfide in a nanocomposite (Abstract and Column 3, line 45 to column 4, line 4, and Claims 1 and 20).

Caldwell et al do not teach the use of ultraviolet light with wavelength in the range of 200-700 nm.

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Bhargava et al teach the use of ultraviolet light with wavelength in the range of 200-700 nm (Abstract and Column 3, line 45 to column 4, line 21, and Figure 2).

Caldwell et al do not teach the first layer positioned on a first side of the second layer, and the second side is opposite the first side on the second layer and the measuring step measures photoluminescence reflected from the first and second side of the second layer.

Bhargava et al teach the first layer positioned on a first side of the second layer, and the second side is opposite the first side on the second layer and the measuring step measures photoluminescence reflected from the first and second side of the second layer (Column 2, line 65 to column 4, line 49).

It would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to combine and substitute the doped or undoped zinc sulfide in a nanocomposite and the use of ultraviolet light with wavelength in the range of 200-700 nm of Bhargava et al in the process of Caldwell et al, since Bhargava et al. state, "The present application also provides methodology for manufacturing quantum size doped semiconductor particles. The methodology is particularly advantageous in that it provides a relatively simple approach to the manufacture of doped quantum sized semiconductor particles at room temperature. Furthermore, the particles so produced are dispersed within a polymer matrix and the reaction which forms the doped particles takes place in the polymer matrix. Thereafter, the polymer matrix maintains the doped particles separate from one another so that they maintain their quantum physical effects without agglomeration (Column 2, lines 6-17) " By employing

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scientific reasoning, an ordinary practitioner would have combined and substituted the doped or undoped zinc sulfide in a nanocomposite and the use of ultraviolet light with wavelength in the range of 200-700 nm of Bhargava et al in the process of Caldwell et al, in order to improve the process for determining the hybridization of a nucleic acid sample. An ordinary practitioner would have been motivated to combine and substitute the doped or undoped zinc sulfide in a nanocomposite and the use of ultraviolet light with wavelength in the range of 200-700 nm of Bhargava et al in the process of Caldwell et al, in order to achieve the express advantages, as noted by Bhargava et al, of an invention which provides methodology for manufacturing quantum size doped semiconductor particles and which is particularly advantageous in that it provides a relatively simple approach to the manufacture of doped quantum sized semiconductor particles at room temperature and furthermore, the particles so produced are dispersed within a polymer matrix and the reaction which forms the doped particles takes place in the polymer matrix that maintains the doped particles separate from one another so that they maintain their quantum physical effects without agglomeration.

***Response to Amendment***

7. In response to amendment, all 103(a) rejections are withdrawn. However, new 102(e) and 103(a) rejections have been included.



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***Response to Arguments***

8. Applicant's arguments with respect to all pending claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arun Chakrabarti, Ph.D., whose telephone number is (703) 306-5818. The examiner can normally be reached on 7:00 AM-4:30 PM from Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones, can be reached on (703) 308-1152. The fax phone number for this Group is (703) 305-7401.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group analyst Chantae Dessau whose telephone number is (703) 605-1237.

**Arun Chakrabarti,**  
**Patent Examiner,**

**August 6, 2002**

  
**W. Gary Jones**  
**Supervisory Patent Examiner**  
**Technology Center 1600**